What is Claimed is:

1. A conductor structure for electronic component applications formed by metal deposition, comprising:

a substrate, having at least one exposed surface;

a first conducting layer, disposed on the exposed surface of the substrate, the first conducting layer having an exposed surface not in contact with the previously exposed surface of the substrate;

a selective passivation layer, capable of penetration by previously selected materials and not penetrable by other selected materials deposited on the exposed surface of the first conducting layer; and

a second conducting layer, comprising a material capable of penetrating through the selectively passivating layer, the second conducting layer deposited on the selective passivation layer and permeating therethrough displacing the selective passivating layer,

wherein the selective passivating layer remains substantially on the surface of the second conducting layer such that the first and second conducting layers are adhered while protected from other ambient conditions by the selective passivation layer.

2. The conductor structure of Claim 1 wherein the substrate comprises at least a portion of an integrated circuit wafer ready for the application of a conductor structure for the purpose of electrically interconnecting two or more integrated circuit components.

3. The conductor structure of Claim 1 wherein the first conducting layer is ruthenium.

4. The conductor structure of Claim 1 wherein the selective passivation layer is iodine.

5. The conductor structure of Claim 1 wherein the second conducting layer is copper.

6. A method for making a conductor structure for electronic component applications formed by metal deposition, comprising the steps of:

selecting a substrate having at least one exposed surface;

depositing a first conducting layer on the exposed surface of the substrate, the first conducting layer having an exposed surface not in contact with the previously exposed surface of the substrate;

depositing a selective passivation layer capable of penetration by previously selected materials and not penetrable by other selected materials on the exposed surface of the first conducting layer; and

depositing a second conducting layer comprising a material capable of penetrating the selectively passivating layer and permeating therethrough, and

displacing the selectively passivating layer with the second conducting layer such that the first and second conducting layers are adhered while additional protected from other ambient conditions by the selective passivation layer.

7. The method of Claim 6 wherein the substrate in the selecting step comprises at least a portion of an integrated circuit wafer ready for the application of a conductor structure for the purpose of electrically interconnecting two or more integrated circuit components.

8. The method of Claim 6 wherein the first conducting layer in the depositing a first conducting layer step is ruthenium deposited by chemical vapor deposition in a deposition chamber.

9. The method of Claim 6 wherein the selective passivation layer in the depositing a selective passivation layer step is ~1 monolayer of iodine deposited by backfilling the deposition chamber with molecular iodine vapor before allowing the introduction of other materials that would cause detrimental surface layers on the ruthenium.

10. The method of Claim 6 wherein the depositing a second conducting layer comprises depositing copper by the process of electrodeposition.

11. A method of depositing a plurality of atomic layers of a second conductor on a first conductor, comprising:

providing on the first conductor, a first material that is penetrable by the second conductor relative to at least a second material other than the second conductor; and

depositing a plurality of atomic layers of the second conductor on the first conductor having the first material thereon, such that the first material is displaced through the plurality of atomic layers of the second conductor during the depositing to provide the first material on the plurality of atomic layers of the second conductor, remote from the first layer.

12. A method according to Claim 11 wherein the first conductor comprises a platinum group metal, the first material comprises a halogen, the second conductor comprises a metal and the second material comprises oxygen.

13. A method according to Claim 11 wherein depositing a plurality of atomic layers of the second conductor on the first conductor having the first material thereon comprises electrodepositing a plurality of atomic layers of the second conductor on the first conductor having the first material thereon.

14. A method according to Claim 11 wherein providing on the first conductor, a first material that is penetrable by the second conductor relative to at least a second material other than the second conductor is preceded by forming the first conductor on a substrate.

15. A method according to Claim 14 wherein the substrate comprises an integrated circuit wafer.

16. A method according to Claim 11 wherein depositing a plurality of atomic layers of the second conductor on the first conductor having a first material thereon comprises overpotential depositing a plurality of atomic layers of the second conductor on the first conductor having the first material thereon.

17. A method according to Claim 11:

wherein providing on the first conductor, a first material that is penetrable by the second conductor relative to at least a second material other than the second conductor comprises providing directly on the first conductor, a first material that is penetrable by the second conductor relative to at least a second material other than the second conductor; and

wherein depositing a plurality of atomic layers of the second conductor on the first conductor having the first material thereon comprises depositing a plurality of atomic layers of the second conductor directly on the first conductor having a first material thereon.

18. A method according to Claim 11 wherein providing on the first conductor, a first material that is penetrable by a second conductor relative to at least a second material other than the second conductor comprises providing on the first conductor about one monolayer of a first material that is penetrable by the second conductor relative to at least a second material other than the second conductor.

19. A method of depositing copper on ruthenium comprising:

forming iodine on the ruthenium; and

depositing a plurality of atomic layers of the copper on the iodine, such that the iodine is displaced through the plurality of atomic layers of copper during the depositing to provide the iodine on the copper, remote from the ruthenium.

20. A method according to Claim 19 wherein depositing a plurality of atomic layers of the copper on the iodine comprises electrodepositing a plurality of atomic layers of the copper on the iodine.

21. A method according to Claim 19 wherein forming iodine on the ruthenium is preceded by forming the ruthenium on a substrate.

22. A method according to Claim 21 wherein the substrate comprises an integrated circuit wafer.

23. A method according to Claim 19 wherein forming iodine on the ruthenium comprises forming about one monolayer of iodine on the ruthenium.

24. A method according to Claim 23 wherein forming about one monolayer of iodine on the ruthenium comprises depositing about one monolayer of iodine on the ruthenium in a deposition chamber.

25. A method according to Claim 24 wherein sputtering about one monolayer of iodine on the ruthenium comprises backfilling the deposition chamber with molecular iodine vapor.

26. A method according to Claim 19 wherein depositing a plurality of atomic layers of the copper on iodine comprises overpotential depositing a plurality of atomic layers of the copper on the iodine.

27. A method according to Claim 19 wherein forming iodine on the ruthenium comprises forming iodine directly on the ruthenium, and wherein depositing a plurality of atomic layers of the copper on the iodine comprises depositing a plurality of atomic layers of the copper directly on the iodine.

28. A conductive structure comprising:

a first conductor;

a plurality of atomic layers of a second conductor directly on the first conductor; and

a first material directly on the plurality of atomic layers of the second conductor, remote from the first conductor, the first material being penetrable by the plurality of atomic layers of the second conductor relative to at least a second material other than the second conductor.

29. A structure according to Claim 28 wherein the first conductor comprises a platinum group metal, the first material comprises a halogen, the second conductor comprises a metal and the second material comprises oxygen.

30. A structure according to Claim 28 further comprising a substrate on the first conductor, remote from the plurality of atomic layers of the second conductor.

31. A structure according to Claim 30 wherein the substrate comprises an integrated circuit wafer.

32. A structure according to Claim 28 wherein the first material comprises about a monolayer of the first material.

33. A conductive structure comprising:

a first layer comprising ruthenium;

a second layer comprising a plurality of atomic layers of copper directly on the first layer comprising ruthenium; and

a third layer comprising iodine directly on the second layer comprising a plurality of atomic layers of copper, remote from the first layer comprising ruthenium.

34. A structure according to Claim 33 wherein the third layer comprises about one monolayer of iodine.

35. A structure according to Claim 33 further comprising a substrate on the first layer, remote from the second layer .

36. A structure according to Claim 35 wherein the substrate comprises an integrated circuit wafer.